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10/509,987	09/30/2004	Dominique David	034299-604	2953

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EXAMINER	
MOFFAT, JONATHAN	
ART UNIT	**PAPER NUMBER**
2863	

DATE MAILED: 05/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/509,987	Applicant(s) DAVID ET AL.	
	Examiner Jonathan Moffat	Art Unit 2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 April 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 March 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Applicant's amendments to the specification, claims, and drawings, filed 4/17/2006, are accepted and appreciated by the examiner. In response all previous objections to the claims, specification, and drawings are withdrawn.

Claim Objections

Claims 19-20 are objected to because of the following informalities: These claim are either self-contradictory or else include new matter not previously covered in the specification. Please see examiner's comments (below) regarding this. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1.

Claims 1-2, 4-5, 7-8, 11-13, 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Abe (US pat 6,636,826).

With respect to claim 1, Abe discloses a device comprising:

1) At least a sensor of angular position, capable of being made solid with the solid (fig 5) and of supplying at least a measuring datum representative of the orientation of the solid (Fig 3 items 401-404).

2) Means for generating test data representative of an estimated orientation of the solid (Fig 3 item 50 and 80).

3) Means for modification of the estimated orientation of the solid by confrontation of the measuring datum and test data (Fig 3 item 60).

With respect to claim 2, Abe discloses that the modification means of the estimated orientation comprise a first comparator connected to the sensor and to the means for generating test data, for receiving the measuring datum and at least a test datum, and for establishing at least a difference between the test datum and the measuring datum (column 3 lines 28-31).

With respect to claim 4, Abe discloses that the device comprise at least an angular position sensor sensitive to the gravity and at least an angular position sensor sensitive to a magnetic field (Fig 3 items 401-404).

With respect to claim 5, Abe discloses the sensor sensitive to gravity comprises at least an accelerometer and the sensor sensitive to a magnetic field comprises at least a magnetometer (Fig 3 items 401-404).

With respect to claim 7, Abe discloses that the means for generating test data comprise a calculator for calculating test data as a function of an estimated orientation, and as a function of parameters characteristic of a response of the angular position sensor (column 3 lines 22-30).

With respect to claim 8, Abe discloses that the calculator is localized on the solid (Fig 5 item 20).

With respect to claim 11, Abe discloses a motion capture device of the rotation of a solid comprising a capture device of the orientation (Fig 3) and means for registering a successive estimations of the orientation of the solid (column 3 lines 60-65).

With respect to claim 12, Abe discloses that the means for registering are localized on the solid (Fig 5 item 20).

With respect to claim 13, Abe discloses a timer for rating the registration of the successive estimations of the orientation of the solid (Fig 3 items 310 and 60). It is well known that digital processors operate with a timer clock. The application of the device by Abe in a virtual reality headset would necessitate that the timer be used for tracking motion.

With respect to claim 19, Abe discloses said calculation means for generating test data representative of an estimated orientation of the solid can generate random test data (Fig 5). The user can move the device at will which, to the computer, would comprise random movement especially when random noise, vibrations inherent in human movement, and other accelerations are taken into account.

2.

Claims 1and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Donahue (US pat 5,526,022).

With respect to claim 1, Donahue discloses a device comprising:

1) At least a sensor of angular position, capable of being made solid with the solid and of supplying at least a measuring datum representative of the orientation of the solid (Fig 1 items 20 and 22).

2) Means for generating test data representative of an estimated orientation of the solid (column 2 lines 56-63).

3) Means for modification of the estimated orientation of the solid by confrontation of the measuring datum and test data (column 2 lines 56-63).

With respect to claim 6, Donahue teaches two sensors each having three axes of sensitivity (Fig 1 items 20 and 22).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3.

Claim 3, 9-10, 14-18, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe in view of Keeler (US pat 5,682,317).

With respect to claim 3, Abe discloses an estimated orientation.

Abe fails to disclose comparing said estimated orientation to a threshold and validating it based on said comparison.

Keeler teaches a second comparator with threshold for comparing the difference established by the first comparator to a threshold value and to validate the estimated orientation, when the difference established by the first comparator is less than the threshold value (Fig 1a item 37 and column 2 lines 32-37).

It would have been obvious to one of ordinary skill in the art to check the validity of the correction value of Abe by comparing it to a threshold as does Keeler. This could be accomplished in the processing calculator of Abe in order to detect and avoid possibly erroneous measurements.

With respect to claim 9, Abe discloses a calculator for generating test data and establishing new estimated orientations.

Abe fails to disclose using error gradient descent.

Keeler teaches that the modification means of the estimated orientation and/or the means for generating a test datum comprise a calculator for establishing a new estimated orientation and/or a new test datum according to a method known as error gradient descent (column 6 lines 31-35).

It would have been obvious to one of ordinary skill in the art to use error gradient descent as does Keeler in the calculator of Abe in order to gradually zero-in on a more precise measurement value. Using gradient descent is well known in the art as a method for parameter estimation.

With respect to claim 10, Abe discloses that the calculator is localized on the solid (Fig 5 item 20).

With respect to claim 14, Abe discloses a method comprising:

a) Capture of measuring data originating from at least one angular position sensor and the establishment of a test datum representative of an estimated orientation of the solid (fig 3 items 401-404).

b) Confrontation of the test datum and the measured datum (Fig 3 item 60).

c) Establishment of a new test datum representative of a new estimated orientation of the solid, corrected as a function of the preceding confrontation (Fig 3 item 60).

Abe fails to teach repeating steps b) and c).

Keeler teaches:

d) Repetition of stages b) and c) (Figs 5a and 12).

It would have been obvious to one of ordinary skill in the art to repeat the steps of Abe multiple times as taught by Keeler in order to continue processing the orientation data towards an acceptable value.

With respect to claim 15, Abe discloses confrontation between a measured and a test datum.

Abe fails to disclose repeated confrontation.

Keeler teaches that the stages are repeated until the confrontation reveals a difference between the test datum and the measuring datum less than a determined threshold (Figs 5a and 12).

It would have been obvious to one of ordinary skill in the art to repeat the comparison of Abe as prescribed by Keeler in order to remove erroneous position estimations and correct the estimations to within a known device tolerance.

With respect to claim 16, Abe fails to disclose using an error gradient method.

Keeler teaches that during stage c), correction calculation is made according to a method known as error gradient descent (column 6 lines 31-35).

It would have been obvious to one of ordinary skill in the art to use error gradient descent as does Keeler in the calculator of Abe in order to gradually zero-in on a more precise measurement value. Using gradient descent is well known in the art as a method for parameter estimation.

With respect to claim 17, Abe discloses a method wherein confrontation test data and the measuring datum comprises the establishment of difference data between successive test data and the measuring datum (column 3 lines 28-31).

With respect to claim 18, Abe discloses that the process is repeated with successive measuring data (column 4 first paragraph). It is the understanding of the examiner that in order for the device of Abe to function (especially in the prescribed application of a virtual reality headset) it must be able to make repeated position measurements.

With respect to claim 20, Abe discloses said calculation means for generating test data representative of an estimated orientation of the solid can generate random test data (Fig 5). The user can move the device at will which, to the computer, would comprise random movement especially when random noise, vibrations inherent in human movement, and other accelerations are taken into account.

EXAMINER'S COMMENTS

With respect to newly presented claims 19 and 20;

The language of the claim states that the data 'can be random' and 'can generate random test data'. The specification, page 10 lines 10-12, states that "The test data are representative of an estimated orientation of the solid which can be random or not." From this context it appears that it is intended that the orientation of the solid can be random, not the test data. The examiner has interpreted the claim to mean that the orientation of the solid (and thus the sensor affixed to it) may be a random orientation which would in effect generate data corresponding to a random orientation. In the understanding of the examiner, any other interpretation would not make sense. It is contradictory to say that the test data can BOTH be random AND correspond to the orientation of the solid. Clearly if it corresponds to the orientation of a real-world object it cannot be random. Further the phrase 'can be' limits the claim only in that the device be capable of though it may not be required to or do so under ordinary operation.

Response to Arguments

Applicant's arguments filed 3/1/2006 have been fully considered but they are not persuasive.

Applicant first argues that, with respect to claim 1, reference Abe fails to disclose generating test data representative of an estimated orientation of the solid. Attention is directed to Figure 3. In summary, as presented in the abstract of Abe, the invention comprises two sets of angular orientation detectors. One (40 and 405) for static angle and one (30 and 310) for motion angle. The outputs of either of these subsystems could be described as test data representative of the estimated orientation of the solid because, although each data could be used to determine the orientation, they are incomplete estimates until the two sets are relied upon together to calculate the final result. Looking only at the items previously highlighted in the previous office action, sensors 401-404 generate measuring datum representative of the orientation of the solid. This information is then passed to components 405, 50, and 80, which further process the data before passing it on to the final modification component 60. The intermediate data, before reaching component 60 is still representative of an estimated orientation of the solid. Alternatively, due to the broad language of claim 1, it could fairly be stated that 301-303 are sensors generating measuring datum, 50 and 80 generate test data (still representative of the orientation because it comes from sensors 401-404), and then unit 60 modifies the estimated orientation using both together.

Applicant then argues, with respect to claim 7, that Abe fails to disclose test data as a function of estimated orientation and characteristic parameters of the sensors. Clearly, the data generated by components 50 and 80 are generated based upon orientation since they manipulate the data created by the sensors as the applicant acknowledged on page 9 the response (with respect to claim 1 and in defining the operation of items 50 and 80 relying on R and P). Further, this calculation must be based, at least in part, on parameters of the sensors in order for them to be compatible. For example, the fact that the sensors are operably connected to components 405, 50, and 80, implies some degree of interaction which is a function of parameters characteristic of the responses of the sensors.

Applicant then argues, with respect to claim 6, that reference Donahue fails to disclose test data representative of the estimated orientation of the solid but presents no evidence to that effect. The examiner maintains that the sensor of Donahue, as described in the cited section (column 2 lines 56-63) generates data representative of the orientation (as it is an orientation sensor after all), which needs to be corrected thus making the data an estimate.

Applicant finally argues, with respect to claim 14, that the sensors of Abe generate only actual data which is not estimated data. The examiner respectfully disagrees and points to the above description of Abe. Each set of sensors produces an estimation of the orientation that is not complete without being combined or affirmed by the final calculation unit using other sensor data.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Moffat whose telephone number is (571) 272-2255. The examiner can normally be reached on Mon-Fri, from 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

5/3/06

JM

BRYAN BUI
PRIMARY EXAMINER